

## Himalayan ants of the genus *Lasius* (Hymenoptera: Formicidae)

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**ABSTRACT.** Keys and descriptions are given for the eleven species of *Lasius* F. that occur in the Himalayan area. The distribution of each species is outlined. Two new species, *L.draco* and *L.mikir*, and the previously unknown male of *L.crinitus* are described.

### Introduction

Five *Lasius* species were listed and described for the Indian subcontinent by Bingham (1903). In the present paper the total number of species known to occur in the Himalayas has been increased to eleven. Two new species similar to *Lasius crinitus* are described: *Lasius draco* sp.n. and *L.mikir* sp.n. A full list of specific synonyms and combinations is given by Wilson (1955) for the remaining species.

The bulk of the material examined here was collected during the course of expeditions by staff of the Natural History Museum, Basel, Switzerland, to Bhutan, Nepal, North India and Pakistan. The initial assortment of species was done by Dr C. Baroni Urbani who himself collected most of the Formicidae in Bhutan and Pakistan. I am deeply grateful to him for the opportunity of examining this material and for his help and guidance throughout the preparation of this paper. I also acknowledge with thanks the excellent drawings of the eleven species discussed here by Mr Armin Coray of the Natural History Museum, Basel.

In this paper distribution is given by traditional geographical areas — Assam, Bhutan, India, Kashmir, Nepal, Pakistan and Tibet, and is without political significance.

### Terminology

The following abbreviations have been used for measurements in this work:

CI	Cephalic index = head width $\times$ 100/ head length
EL	Eye length = maximum length of eye
EW	Eye width = maximum width of eye measured at 90° to EL
FTSC	Fore tibia seta count = number of standing hairs on outer surface of fore tibia
HL	Head length = maximum length measured from mid point of occipital border to midpoint of anterior clypeal border
HW	Head width = maximum width of head including eyes
SI	Scape index = scape length $\times$ 100/ head width
SL	Scape length = maximum straight line length of scape excluding basal bulb
SSC	Scape seta count = number of projecting hairs on scape viewed in plane of flexion

Abbreviations used for depositories are: CC, Collingwood Collection; NHMB, Natural History Museum, Basel.

### Key to workers

- 1 Colour shining jet black (head large, broadly cordate) . . . . . *fuliginosus*

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- Colour various, from clear yellow to brownish or greyish black . . . . . 2
- 2 Eye length greater than one fifth head length; colour pale brown to greyish black . . . . . 3
- Eye length one sixth head length or less; colour yellow to yellowish brown . . . . . 5
- 3 Scapes and fore tibiae with abundant standing hairs . . . . . *niger*
- Scapes and fore tibiae with pubescence only . . . . . 4
- 4 Frontal furrow clearly marked; ocelli visible at low magnification; occipital corners without projecting hairs; tibiae always hairless . *brunneus*
- Frontal furrow indistinct or obscured by pubescence; ocelli not discernible at X 40 magnification; projecting hairs at back of head extend around occipital corners; hind tibiae occasionally with a few scattered suberect hairs . . . . . *alienus*
- 5 Petiole low and thick, subconical in side view with rounded dorsal crest; genae curving inwards below eyes to close-set mandibular insertions . . . . . *carniolicus*
- Petiole tapering dorsally in side view; genal margins straight or curving gently to wide-set mandibular insertions . . . . . 6
- 6 Petiole, in front view, with deeply emarginate dorsal crest . . . . . *bicornis*
- Petiole, in front view, with unbroken dorsal crest or with shallow emargination . . . . . 7
- 7 Large species — head width 0.95–1.25 mm . . . . . 8
- Smaller species — head width 0.74–0.86 mm . . . . . 10
- 8 Petiole in front view high, conical, tapering to narrow rounded dorsal crest . . . . . *mikir*
- Petiole in front view with broadly rounded sides; dorsal crest entire or with slight median emargination . . . . . 9
- 9 Petiole and basal face of gaster with very long curved hairs; tibiae without projecting hairs; occipital hairs restricted to median area; dorsal crest of petiole convex, occasionally with slight median incision . . . . . *crinitus*
- Petiole and basal face of gaster with straight hairs; tibiae with suberect hairs; occipital hairs extend round occipital corners; dorsal crest of petiole narrowly flattened or with very slight emargination . . . . . *draco*
- 10 Scapes and tibiae with suberect hairs; eyes small, ommatidia 25 or less; maxillary palps short . *talpa*
- Scapes and tibiae without projecting hairs; eyes relatively large, ommatidia 35 or more; maxillary palps elongate . . . . . *alienoflavus*
- 2 Size small, head width less than 0.90 mm; petiole bluntly conical in profile . . . . . *carniolicus*
- Head width 1.20 mm or greater; petiole tapering, scale-like in profile . . . . . 3
- 3 Petiole deeply cleft; depth of emargination at least as great as distance across bicornate crests . . . . . *bicornis*
- Petiole with dorsal crest entire, or with small or shallow emargination . . . . . 4
- 4 Scapes and tibiae with many erect hairs . . . . . 5
- Scapes and fore tibiae bare or with occasional hairs standing out from general pubescence . . . . . 6
- 5 Body uniformly light brown; terminal maxillary palps very short; eyes distinctly hairy . . . . . *talpa*
- Body greyish brown to black; terminal maxillary palps elongate; eyes with occasional microscopic hairs only . . . . . *niger*
- 6 Large species; head width 1.90 mm or more at least as wide as alitrunk anterior to tegulae; petiole and basal face of gaster with numerous very long curved hairs . . . . . *crinitus*
- Head width 1.70 mm or less, narrower than alitrunk; body hairs straight . . . . . 7
- 7 Head nearly as wide as alitrunk; scapes and tibiae always bare . . . . . *brunneus*
- Head distinctly narrower than alitrunk; appendages pubescent with occasional suberect hairs . . . . . 8
- 8 Appendages thickly pubescent; colour brownish; eyes hairy; maxillary palps relatively short . . . . . *alienoflavus*
- Appendages moderately pubescent only; colour greyish; eyes bare; maxillary palps elongate . . . . . *alienus*

### Key to females

(Females of *mikir* and *draco* are unknown).

- 1 Colour shining black; scutum overhangs pronotum in side view . . . . . *fuliginosus*
- Colour yellowish brown to greyish black; scutum does not overhang pronotum . . . . . 2

### Key to males

(The males of *alienoflavus*, *mikir* and *draco* are unknown).

- 1 Mandibles with denticulate masticatory border . . . . . 2
- Mandibles with a single large apical tooth . . . . . 4
- 2 Head width greater than 1.10 mm; body hairs abundant, long and curved . . . . . *crinitus*
- Head width less than 0.95 mm; body hairs straight . . . . . 3
- 3 Petiole subconical in side view, dorsal crest rounded entire . . . . . *carniolicus*
- Petiole tapering in side view, dorsal crest deeply bicornate . . . . . *bicornis*
- 4 Mandibles with sharply angular basal corner and distinct pre-apical cleft . . . . . *talpa*
- Mandibles with rounded basal angle and no pre-apical cleft . . . . . 5
- 5 Scapes and tibiae with numerous suberect hairs . . . . . *niger*
- Scapes and tibiae hairless . . . . . 6
- 6 Colour shining black; head strongly emarginate posteriorly . . . . . *fuliginosus*

- Colour brownish to brownish black, back of head straight or convex . . . . . 7
- 7 Head nearly as wide as alitrunk; frontal furrow clearly marked; wings infusate . . . . . *brunneus*
- Head distinctly narrower than alitrunk; frontal furrow obscure; wings completely clear . . . . . *alienus*

***Lasius alienus* (Foerster, 1850) (Fig. 1)**

**Diagnosis.** Worker. Unicolorous brownish black or greyish black, similar to *niger* but in general somewhat smaller. Suberect hairs absent or much reduced in number on scapes and tibiae. Ocelli absent or difficult to discern.

**Female.** Greyish black. Size large relative to worker. Head distinctly narrower than alitrunk. Suberect hairs absent on scapes and fore tibiae often present in reduced number on hind tibiae.

**Male.** Greyish black. Wings clear. Mandibles edentate. No suberect hairs on scapes or tibiae. Head without distinctly marked frontal suture.

**Himalayan distribution.** PAKISTAN:

Naran, Kagan, 2600 m, ♀♀ (NHMB). KASHMIR: Pahalgam, 3100 m, ♀♀. Kohala, 1000 m, ♀♀ (NHMB). Other records. Kashmir: Srinagar (Wilson, 1955).

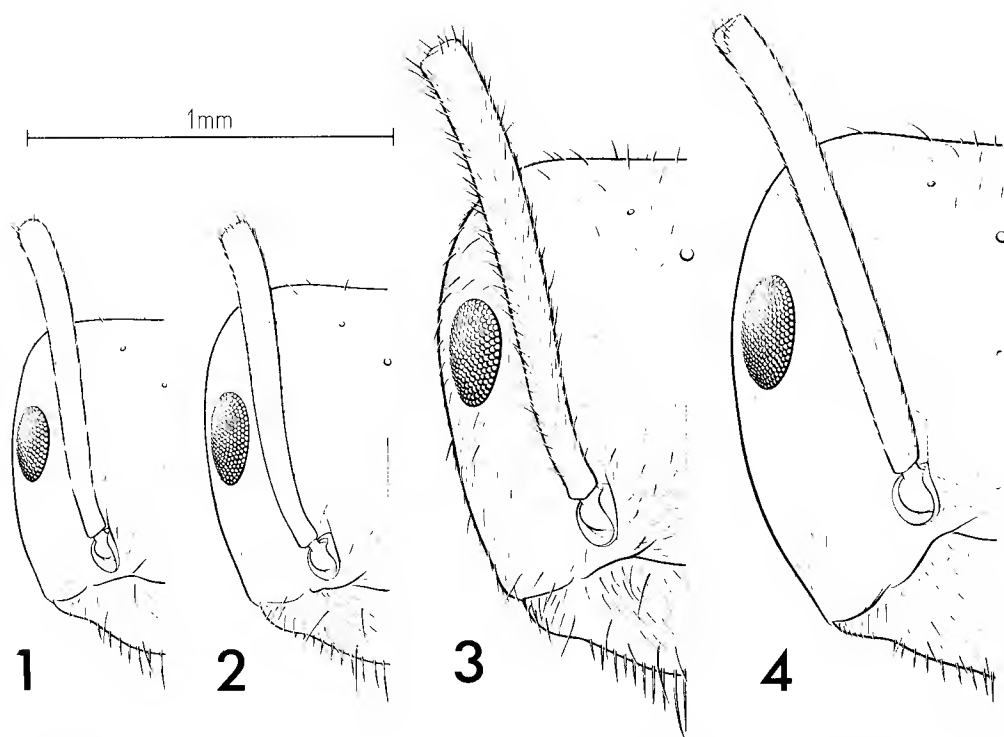
**General distribution.** Wide-ranging Holarctic; Eastern North America to Japan.

**Discussion.** No queens or males from the Himalayas are available for comparison with European material but the series of workers taken are typical except for those from Pahalgam where some specimens have widely spaced suberect hairs on all tibiae.

***Lasius brunneus* (Latreille, 1798) (Figs. 2 and 11)**

**Diagnosis.** Worker. Bicoloured with head and alitrunk pale brownish, contrasting with darker gaster. Ocelli small but clearly visible. Tibiae and scapes always entirely lacking standing hairs.

**Female.** Dark reddish brown. Head relatively



FIGS. 1–4. Half heads, dorsal view. 1, *Lasius alienus*; 2, *Lasius brunneus*; 3, *Lasius niger*; 4, *Lasius fuliginosus*.

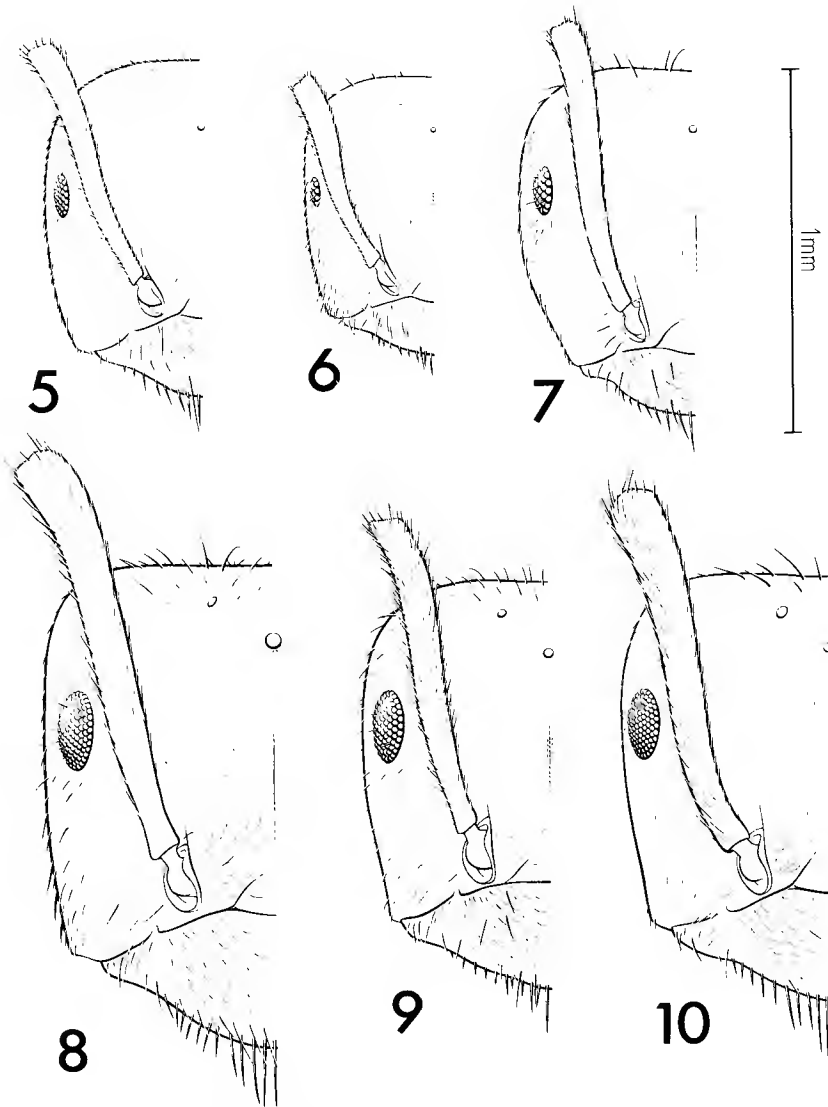
large, width only marginally less than alitrunk width. Frontal suture and triangle well marked. No appendage hairs. Eyes with occasional short hairs.

Male. Dark brown. Head with distinct frontal suture; mandibles broad but edentate. No appendage hairs. Wings dusky.

*Himalayan distribution.* INDIA: Monall, 2300 m, ♀♀ (NHMB). PAKISTAN: Kalan, Swat, 2300 m, ♀♀ (NHMB). Other records: Pakistan: Lahore (Wilson, 1955).

*General distribution.* Western Eurasia, Spain to Himalayas, North Africa to Sweden.

*Discussion.* This is a tree-dwelling species characteristically occurring in relatively large colonies within decayed or damaged parts of living trees. *L. brunneus* var. *himalayanus* Forel was synonymized by Wilson (1955) as the syntypes were well within the normal range of variability of European series. The present material, consisting of a few workers only, appears typical.



FIGS. 5–10. Half heads, dorsal view. 5, *Lasius alienoflavus*; 6, *Lasius talpa*; 7, *Lasius carniolicus*; 8, *Lasius crinitus*; 9, *Lasius draco*; 10, *Lasius mikir*.

*Lasius niger* (Linnaeus, 1758) (Fig. 3)

**Diagnosis.** Worker. Greyish to brownish black. Head relatively large, eye length more than  $\times 0.20$  head width. Abundant standing hairs on scapes and tibiae.

**Female.** Much larger than worker. Larger than most other *Lasius* females with massive alitrunk which is wider than head (HW 1.52–1.82 mm). Abundant standing hairs on scapes and tibiae. Greyish black, wings clear.

**Male.** Body and appendages sparsely covered with standing hairs. Head narrower than alitrunk. Mandibles edentate. Colour brownish to greyish black, wings clear.

**Description based on Himalayan material.** Worker. Size varies between 3.5 and 6.0 mm, variability greater than in European populations (3.5–5.0 mm). Colour usually dark brown but about 20% tending to have a reddish alitrunk approaching the *L. emarginatus* (Olivier) condition. Some Asiatic populations from China and Afghanistan tend to have a yellowish body colour. EL 0.25–0.31 mm, EW 0.18–0.23 mm, HL 0.94–1.43 mm, HW 0.81–1.40 mm, SL 0.88–1.35 mm, CI 86.1–98.2, SI 90.74–109.68, SSC 12–32, FTSC 8–26.

**Female.** The Himalayan females available for comparison with European material are

characterized by their larger size and generally reduced pilosity. EL 0.45–0.47 mm, EW 0.34 mm, HL 1.79–1.87 mm, HW 2.02–2.11 mm, SL 6.53 mm, CI 112.5–115.94, SI 72.84–73.85, SSC 2–13, FTSC 11–26.

**Himalayan distribution.** PAKISTAN: Naran (Kagan Valley), 2600 m, 25.v.1974 (NHMB); Nathagali (Wilson, 1955). NEPAL: Arun River Valley, Duna, 2400 m, 1.vi.1973 (Lay) (CC); Bakkri Kharka (Collingwood, 1971). INDIA: Darjeeling-Chim Khona (Ghoom), 2000–3000 m. Rimbrick 2350 m, Rimbrick, Raman, 1950–2450 m; Raman, 2450 m; Bharapatea-Lebong, 1800 m; Meghalaya, Upper Shillong, 1900 m; Marsphlang, 1850 m. (NHMB). KASHMIR: Pahalgam, 2200–3100 m. (NHMB) BHUTAN: Tangu, 22 km N Thimpu, 2600–2800 m; Gogona, 3100 m; Between Puntsholing and Thimpu, 1780 m; Gidappu, 2300 m; Nobding, 41 km W Wangdi Phodrang, 2800 m; Ghangra, 18 km S Tongsa, 1400–1600 m, 20 km S. Thimpu, 2300 m. (NHMB). TIBET: Recorded from several localities by Eidmann (1941).

**General distribution.** An abundant Holarctic species, Western United States to Japan.

**Discussion.** Himalayan populations are striking for their large size variability; the larger workers are nearly twice as big as the smaller ones. The number of standing hairs on

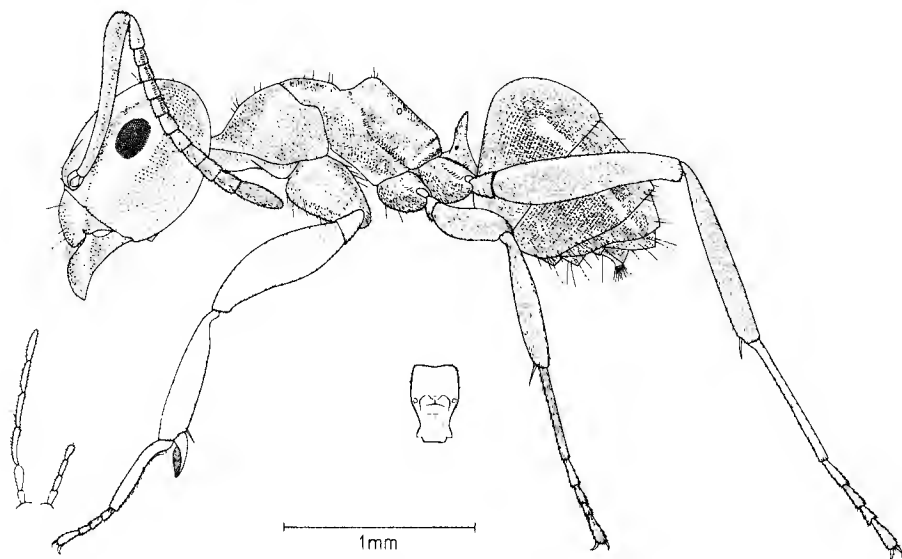
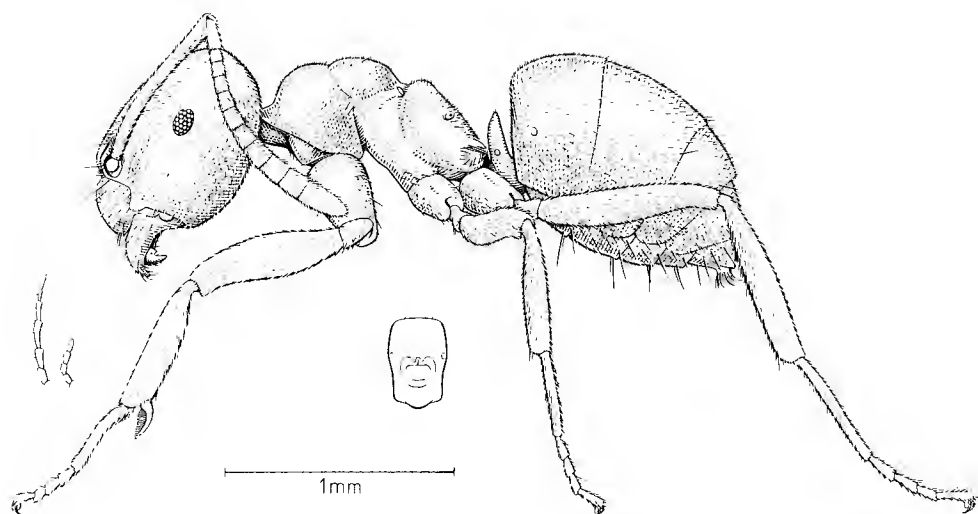
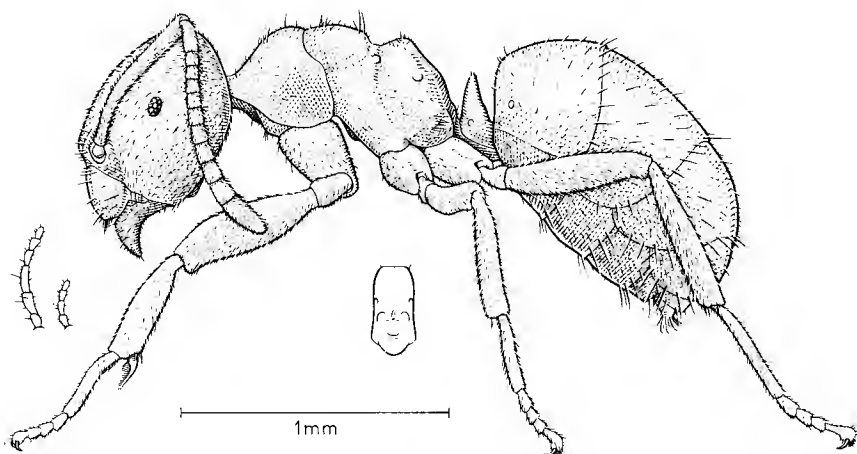


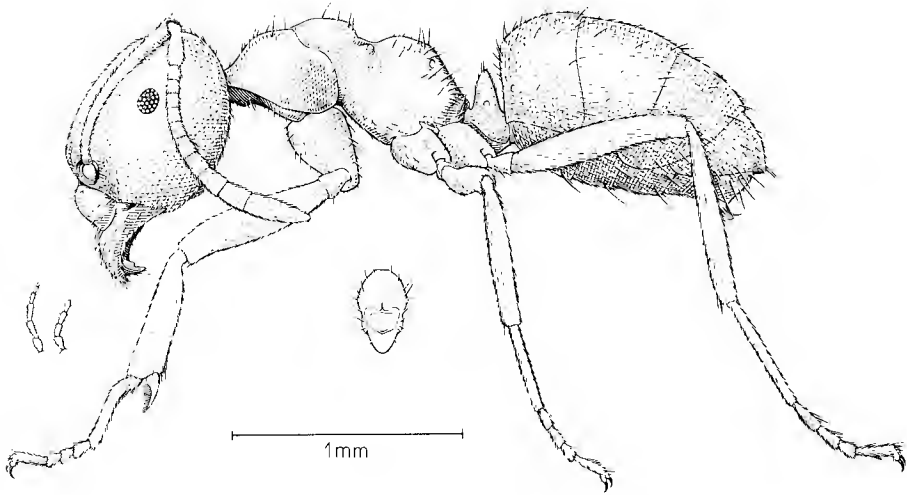
FIG. 11. *Lasius brunneus*, worker profile.

FIG. 12. *Lasius alienoflavus*, worker profile.

the scape also varies with a suggestion of a weak negative allometry with size; however, differences in seta counts among different geographic populations do not fall into a single trend. Yamauchi & Hayashida (1970) described a new species, *L. sakagamii*, from Japan. This species is characterized by a reddish alitrunk and larger SSC values compared with typical *L. niger*. Some of the Himalayan samples would fall within the described range of characteristics of *sakagamii* and fit equally well samples seen from Kanagawa Prefecture in Japan and two syntype workers from Taiwan labelled *niger coloratus* Santschi (NHMB No.

XXI V. e. 1693). However, the subspecies *coloratus* was synonymized by Wilson (1955) and, although there are some strikingly bicoloured or hairy specimens among the Himalayan material, one can only agree tentatively with Wilson's conclusion. Very hairy specimens (equivalent to *coloratus-sakagamii*) predominate in the West Himalayas (e.g. Kagan Valley, Pakistan) while the Eastern Himalayan samples are much more of the European type with respect to pilosity. Specimens with more or less reddish alitrunks, on the contrary, are found irregularly throughout the Himalayan range.

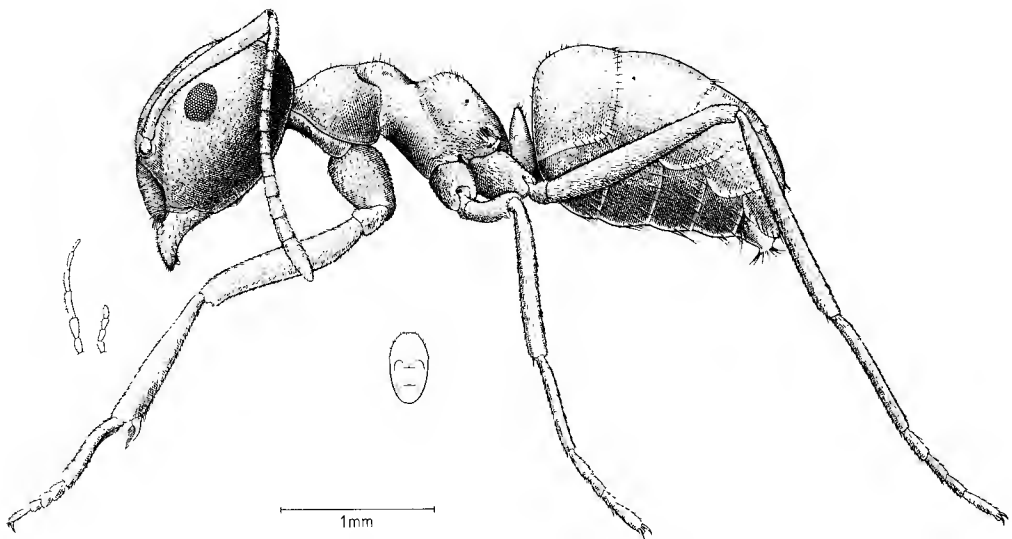
FIG. 13. *Lasius talpa*, worker profile.

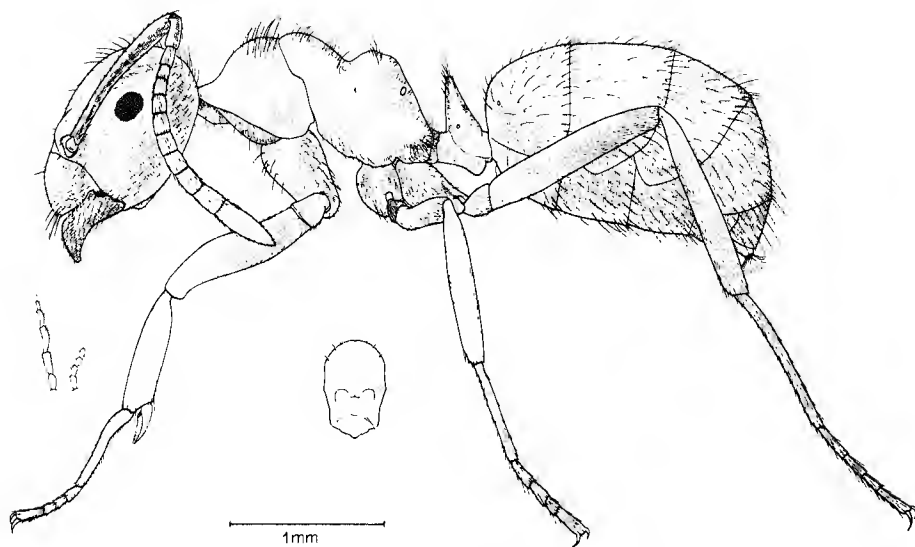
FIG. 14. *Lasius carnolicus*, worker profile.

Yamauchi & Hayashida (1970) point out a remarkable difference in the shape of the male subgenital plate between *sakagamii* and *niger*. Males from Tatsienlu, China, appear to be somewhat intermediate between the two extremes figured by Yamauchi & Hayashida (1970) and show some variability but more or less approach the *sakagamii* type. On the other hand, workers associated with these males are typically *niger* for the SSC but the colour is nearly uniformly yellowish. Clausen

(1938) figured a subgenital plate from a typical specimen from a *niger* population from Zurich, Switzerland, that corresponds closely with that drawn for *sakagamii*.

Some Japanese *niger* populations do show remarkable differences from corresponding European populations, the SSC varying between 36 and 47 compared with 13–25. However, even a subspecific separation between Eastern and Western populations appears untenable when peripheral island

FIG. 15. *Lasius fuliginosus*, worker profile.

FIG. 16. *Lasius crinitus*, worker profile.

populations are compared (for example, Tenerife: SSC 37–45; Malta: SSC 45–55).

Some central Asiatic populations, including part of the Himalayan material, have considerably more elongate eyes than European populations; however, there is no clear split within the Himalayan material on the basis of this character. Several specimens show a considerable elongation of the scape (SI = 105) compared with typical European *niger* populations (SI generally less than 103) but a similar elongation occurs in populations from the Balearic Is, North Africa, Malta and the Canary Is.

***Lasius alienoflavus* Bingham 1903** (Figs. 5 and 12)

**Diagnosis.** Worker. A small yellowish brown species characterized by thick pubescence which is especially abundant and subdecumbent on the appendages, sparser and often dendritic on the gaster. Eyes are relatively larger and the maxillary palps relatively longer than in most species of the *L. flavus* species-group. This species is so far known only from the Himalayas.

**Description.** Worker. Yellowish brown. Head small, rather square, with broadly emarginate occipital border. Head at sides,

alitrunk and appendages thickly clothed with subdecumbent pubescence and occasional longer hairs. Eyes with hairs. Some longer body hairs on mesonotum.

Funiculus segments 2–5 subrectangular, slightly longer than broad. Eyes relatively large, ommatidia 35–45. Maxillary palps long with segments 5 and 6 subequal. Length 2.75–3.0 mm. Mean EL 0.1 mm, EW 0.1 mm, HW 0.75–0.85 mm, SI 91.5–93. Petiole width 0.218–0.258 mm 100 × PW; HW 22–26.

Female (after Bingham, 1903). 'Much larger, dark brown, alitrunk remarkably large, shape of head as worker; petiole broadly emarginate above'.

Male. Unknown.

**Distribution.** Himalayas, North India (Bingham, 1903). PAKISTAN: Nathia Gall, Bara Gall, Chikar, Chopal, Murree, Kawai Khagan, Daksum, 1600–2300 m, ♀♀ (NHMB). BHUTAN: Wangdi Phodran, ♀♀ (NHMB). NEPAL: Talphi-Jumla, 25.ix.72 (*H. Franz*) ♀♀ (NHMB).

**Discussion.** This interesting species is in many respects midway between the *niger* and the *flavus* species-groups in eye size and length of palpal segments. However, Wilson (1955) considered it to be a member of the *flavus* group and assigned it to the subgenus *Chthonolasius*. Collections were made from



soil, under stones and in leaf litter. It is noteworthy that the localities where it was collected by the NHMB expeditions were generally not those where *niger* was found, suggesting that the two species occupy similar territory but are mutually exclusive.

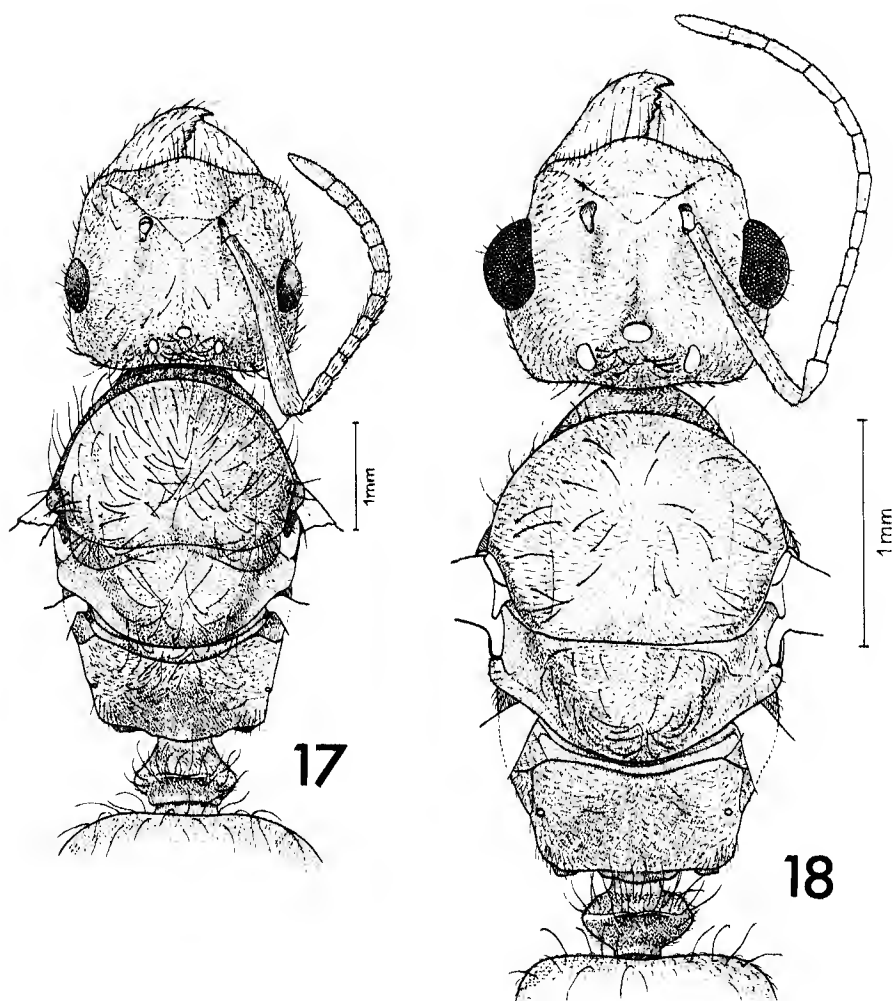
A series of three workers taken by H. Franz in West Nepal differs from the Bhutan and Pakistan material in having relatively larger eyes, ommatidia 52, wider petiole  $100 \times \text{PW}$ : HW 27–34 and considerably less pubescence on body and appendages. The material is insufficient to judge whether the Nepalese specimens are specifically distinct: in some ways they overlap with Wilson's description of

*alienoflavus* from Forel's original specimens collected in North India (Wilson, 1955).

***Lasius talpa* Wilson, 1955 (Figs. 6 and 13)**

**Diagnosis.** A small yellow species similar in all castes to *L. flavus* (F.) but distinguished by the presence of suberect hairs on the scapes, tibiae and genal margins. Previously recorded only from China, Japan and Korea.

**Description.** Worker. Clear yellow; body and appendages with dense adpressed pubescence. Body hairs numerous on gaster, sparse but longer on alitrunk. Projecting occipital



FIGS. 17–18. Head and alitrunk, *Lasius crinitus*, dorsal view: 17, female; 18, male.

hairs extend round head to the mandibular insertions. Suberect hairs present on scapes and all tibiae. Eyes small, ommatidia 25 or less. Funiculus segments 2–5 broader than long. HW 0.74–0.79 mm, SI 79.

Female (after Wilson, 1955). Uniformly light brown. Head small, HW 1.33–1.35 mm, distinctly narrower than alitrunk. Scapes with numerous standing hairs.

Male (after Wilson, 1955). Brown; appendage hairs sparse. Dentition of *flavus* type with a sharply angular basal corner and a smooth concave masticatory border with a pronounced pre-apical cleft. Head width smaller than alitrunk width. Subgenital plate subquadrate with a prominent setiferous lobe; postero-lateral flanges very thin and acute.

*Himalayan distribution.* PAKISTAN: Sunni Murree, Bara Gall, Chopal, Khangha, Mandam, 1800–2800 m (NHMB).

*Discussion.* This species has hitherto only been recorded from China, Japan and Korea. In China a series of workers was taken at 2000 m in a small rotting stump (Wilson, 1955). In Pakistan it occurred in soil and leaf litter.

Ecological information is too sparse to indicate whether or not *talpa* has similar habitat requirements to *flavus*. *L. flavus* itself does occur sympatrically with *talpa* in China, Japan and Korea. Eidmann (1941) recorded *flavus* var. *myops* from Tibet, but the specimens in NHMB are actually referable to the genus *Pseudolasius*.

***Lasius carnolicus* Mayr, 1861 (Figs. 7 and 14)**

*Diagnosis.* Worker. Small yellow species, HW 0.75–0.85 mm with small eyes and shortened palps, having a node-like petiole forming a rounded conical peak both in profile and in front view. Body and appendage pubescence rather long and thick with occasional subdecumbent longer hairs projecting from tibiae and scapes (the similar *L. reginae* Faber, 1967, has short adherent pubescence with no hairs standing out from tibiae or scapes). Head cordate, genae curving inwards to close-set mandibular insertions.

Female. Brownish yellow, no larger than worker, HW 0.75–0.8 mm but developing

extreme physogastry in the egg-laying mature female. Petiole shape and pilosity as in worker. Eyes strongly haired. Mandibles with prominent apical tooth and concave masticatory border.

Male. Brown, as small as worker. HW 0.83 mm. Petiole conical in profile. Eyes strongly haired. Mandibles denticulate.

*Himalayan distribution.* Karakoram (Bingham, 1903) PAKISTAN: Naran, 2400 m, ♀♀ (NHMB).

*General distribution.* Spain to Central Asia, Italy to South Sweden. Recorded from Afghanistan and from the Karakoram mountains (Faber, 1967).

*Discussion.* The sample of workers taken in Pakistan appear to be typical *carnolicus* in pilosity and other characters. In Europe, the colony-founding queen forces adoption in nests of either *flavus* or *alienus*. Colonies are found under stones in sheltered valleys or on south facing slopes with free draining light soil.

***Lasius fuliginosus* Latreille, 1798 (Figs. 4 and 15)**

*Diagnosis.* Worker. Shining black; head large, deeply concave posteriorly with broadly rounded occipital lobes. No appendage hairs; gaster hairs short, pronotal hairs longer: 0.1–0.12 mm. Petiole in side view thick with bluntly rounded dorsal crest.

Female. Shining black with abundant pubescence only partly obscuring cuticular shine. Body hairs numerous, short not sinuate. Head wider than relatively slender alitrunk, cordate as in worker. Scutum overhanging pronotum in side view. Antennal scapes short-elliptical in cross section.

Male. Black. Head broad, about as wide as alitrunk, emarginate posteriorly, curving moderately to mandibular insertions. Mandibles edentate or with irregular minute denticulae. Petiole with blunt convex dorsal crest.

*Himalayan distribution.* Not recorded from the Himalayas but with an old record from Thana, Bombay (Bingham, 1903); also two workers labelled Dharwan, Mysore, H. Swale 1913 (CC).

*Discussion.* This widely distributed Eurasian species, found from Portugal and West Ireland

to Korea and Japan, has a large gap in its known distribution between South-west Europe and Eastern Asia. The two old records from West India (remarkable in being far to the south of other *Lasius* records) and its very wide geographical range suggest that *fuliginosus* should occur in the Himalayas.

Workers of this species are relatively conspicuous, moving in open files in daytime but normally in semi-shade. Nests are of carton constructed in the base of old trees, hedgerows and walls.

### *Lasius bicornis* (Foerster, 1850)

**Diagnosis.** Species in the *Lasius umbratus* group distinguished by the deeply indented bicornuate petiole, sparse but long gaster hairs and absence of genal or appendage hairs. The small size of queens and males distinguish *bicornis* from *L. affinis* Mayr.

**Description.** Worker. Pale clear yellow; head width 1.02–1.10 mm, petiole narrow, tapering with deeply indented bicornuate crest. Gaster hairs sparse; genal, scape and tibial hairs entirely absent.

Female. Size small compared with worker and with other species of *umbratus* group – head width 1.24–1.25 mm, wider than alitrunk. Petiole and pilosity as in worker.

Male. Size small, head width 0.96 mm, as wide as alitrunk. Petiole deeply emarginate. Scapes and tibiae bare.

**Himalayan distribution.** KASHMIR: 1 ♀ Daksun, 13.vii.76 (Wittmer) (NHMB). Kashmir (Wilson, 1955), Tibet (Menozzi, 1939).

**General distribution.** A rather rare Eurasian species recorded from France to the Himalayas and from Italy to South Sweden. Diagnosis and synonyms given by Wilson (1955) and further description and locality records given by Poldi (1962). This species has been taken in rotten stumps and fallen timber in Europe.

### *Lasius crinitus* Smith, 1858 (Figs. 8 and 16–21)

**Diagnosis.** Known only from the Himalayas where it is locally common with alatae frequently taken in light traps. This is the largest known species of *Lasius* with females having a

head width of up to 2 mm. All castes have very long, curved body hairs which are specially numerous on the petiole and the basal face of the gaster. The petiole has broadly rounded dorsolateral corners tapering to a convex dorsal crest.

**Description.** Worker. Reddish yellow; head width 1.12–1.24 mm. Petiole in front view broadly rounding to convex dorsal crest which in some specimens have a narrow, shallow median incision. Body hairs long and coarse, length 0.18–0.23 mm. Legs without projecting hairs except on coxae; scapes with short suberect pubescence. Occipital hairs restricted to median area. Eyes hairy. Gaster pubescence moderately dense.

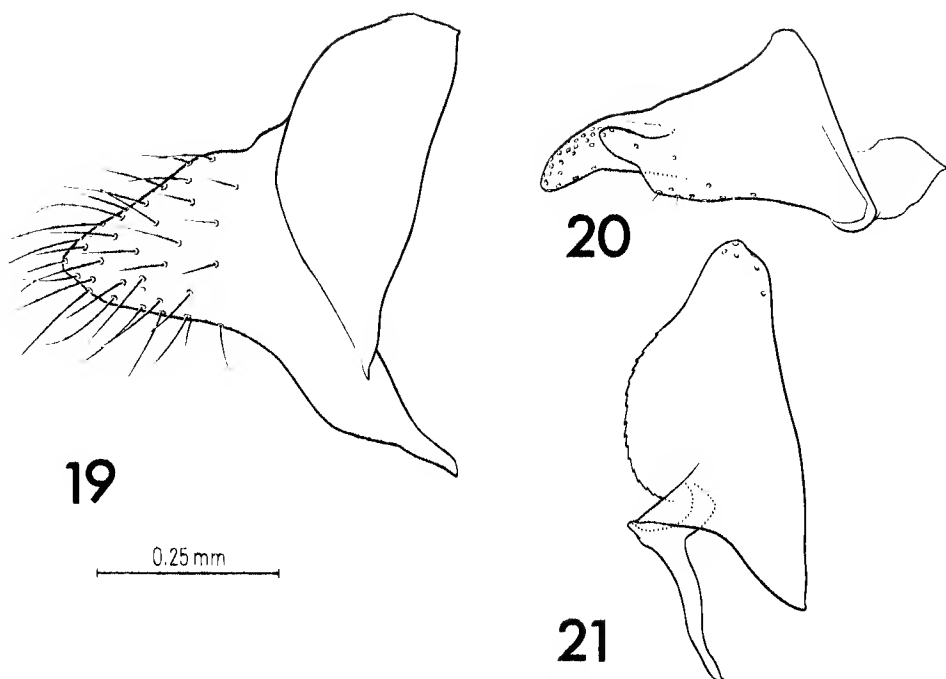
Female. Pale yellowish brown to brown, wings infusate. Size exceptionally large, head width 1.9–2.1 mm; pronotal width 1.75–1.88 mm. Alitrunk and gaster with numerous long fine curved hairs, specially dense on petiole, shorter and sparser on head; eye hairs long and conspicuous. Petiole broadly rounded in front view, tapering in side view.

Male. Brown, wings infusate. Head as wide as alitrunk. HW 1.12–1.25 mm. Mandibles large with broad masticatory border, with seven denticles and offset basal tooth. Petiole in front view with sides broadly rounding to unbroken convex dorsal crest. Pubescence moderately dense, especially on first gaster tergite. Pilosity as in queen but less abundant, more sparse on head; eyes with long hairs. Appendages pubescent only, without suberect hairs.

**Distribution.** SIKKIM, KASHMIR (Wilson, 1955). BHUTAN: Puntsholing, Thimpu, Para, Gogona, Tangu, Gimakotl, Wangdi, 2000–3000 m (NHMB). NEPAL: Junbesi (Collingwood, 1971) Arun river valley, Duna, 25.v.73 (NHMB); Bdota 3000 m, 14.iv.1973 (Lay) (NHMB). INDIA: Darjeeling, Chimkona (NHMB).

**Discussion.** Alatae were taken sometimes in large numbers at night, implying a nocturnal flight behaviour during the months of May and June. One colony series was taken by D. M. Lay in a rotten log. Other worker series were taken in soil and in leaf litter.

This species was linked with *L. carnolicus* by Wilson (1955), because of the tapering rounded petiole, but its affinities are more



FIGS. 19–21. Male genitalia, *Lasius crinitus*: 19, paramere; 20, digitus and cuspis; 21, penis valve and aedeagus.

clearly with the *umbratus* species-group. It may be postulated that, as with other species in the *umbratus* group, fertilized queens found fresh colonies by securing adoption by *niger* or allied species. However, there is as yet no field evidence for this.

***Lasius draco* sp.n. (Figs. 9 and 22)**

**Diagnosis.** Worker. A high mountain species from Bhutan related to *L. crinitus* but differing in smaller body size, abundant subdecumbent appendage hairs and straight body hairs. In frontal view the petiole sides slope inwards to a narrow, flattened or feebly emarginate dorsal crest.

**Description.** Worker. Total length 4.0–4.3 mm. EL 0.15–0.17 mm. HL 1.08–1.15 mm. HW 0.95–1.05 mm. SL 1.00–1.01 mm. CI 92–93. SI 96–97. SSC 45–58. Longest hair on gaster dorsum 0.127 mm, maximum width of hind tibia 0.161 mm.

Head robust with subparallel sides and straight to feebly emarginate occipital border.

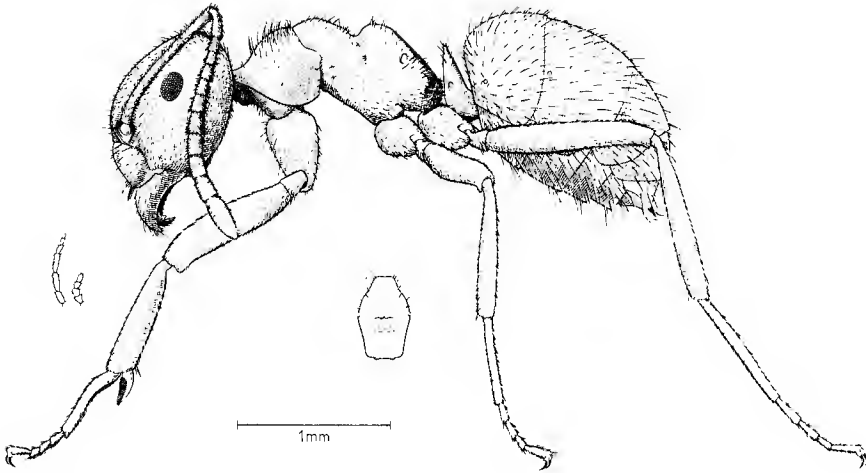
Eyes relatively large with maximum diameter twice maximum scape width. Frontal triangle wider than high. Scape long and thin in the plane of flexion; funiculus segments elongate.

Body colour yellow. Dorsal body pubescence sparse, especially on gaster which is shining. Gaster hairs numerous, straight, arising from large shallow pits. Eyes with long hairs; long occipital hairs continue as a scattered fringe of shorter hairs around genal margins. Tibial hairs subdecumbent to suberect, sparse on front tibiae. Scape hairs abundant.

**Material examined.** Holotype ♀, BHUTAN: Nobding 41 km east of Wangdi, 18.vi.1972 (*Baroni Urbani*) (NHMB). Paratypes. 15 ♂♂ with same data as holotype. 3 ♀♀, Sampa Kotoka (*Baroni Urbani*) (NHMB; CC).

**Distribution.** Bhutan.

**Discussion.** *L. draco* is very similar to *L. jensi* Seifert from Central Europe but has the palpi more slender, the head relatively longer, the tibial pilosity less erect and the gaster hairs longer. It differs from both *mikir* and *crinitus* by its abundant appendage

FIG. 22. *Lasius draco*, worker profile.

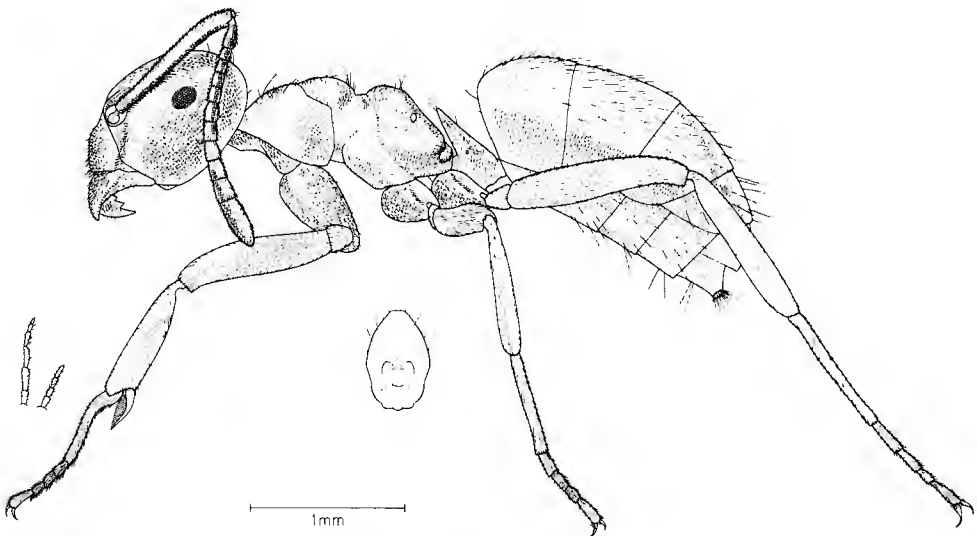
pilosity and from *L. meridionalis* Bond and *L. rabaudi* Bond by the strongly convex petiole. The Nobding series was collected from under a stone. The Sampa Kotoka workers were collected from soil.

***Lasius mikir* sp.n. (Figs. 10 and 23)**

**Diagnosis.** Worker. A southern species related to *crinitus* but with reduced and more adpressed body pilosity, clearer body colour and more parallel-sided head.

**Description.** Worker. Total length 3.9–4.6 mm. EL 0.17–0.21 mm; EW 0.13–0.16 mm; HL 1.17–1.30 mm; HW 1.09–1.22 mm; SL 1.01–1.12 mm; OI 62.50–85.71; CI 91.30–94.00; SI 91.49–97.62.

Head robust with subparallel sides and feebly emarginate occipital border. Eyes relatively large: their maximum diameter about twice the maximum scape width. A smooth trace of frontal furrow. Antennae elongated. Mesosomal dorsum slightly higher than the propodeum in side view. Petiole thin, with plane and superiorly converging

FIG. 23. *Lasius mikir*, worker profile.

anterior and posterior faces. Scale in frontal view with almost straight, converging sides and a pointed, non-emarginate apex. Frontal area and tarsi inflated.

Body colour moderately shining and entirely pale yellow, much paler than in any other known Himalayan species. Anterior clypeal border and mandibles brown. Integument smoothly punctate and very finely reticulate. The whole body is covered by fine, silky and adpressed pubescence. Antennae and legs entirely destitute of standing hairs. Some sparse whitish subdecumbent hairs on the frons, in number never exceeding 6–7 on the full cephalic profile. Analogous hairs (but often longer, suberect and curved) visible on the dorsal outline of the alitrunk and concentrated on the median areas of the pronotum, mesonotum and propodeum. 4–6 standing straight hairs on the external border of the scale. Gaster sparsely covered with adpressed straight hairs partly arranged in files at the border of every tergite.

*Material examined.* Holotype ♀, ASSAM: Kharangma (Mikir Hills), 21.xii.1963, (Rajagopal) (ZSI). Paratypes. 6 ♂♂ with same data as holotype. (Zoological Survey of India, Shillong; NHMB; CC.)

*Discussion.* *L. mikir* is clearly related to *crinitus* in body size, pilosity and scale shape but is distinguishable by the much less abundant pilosity on the head and coxae, the paler colour and shape of the scale. The discovery of *mikir* in Assam is of great interest as it is a definite record of a *Lasius* species inhabiting a tropical environment. Unfortunately, no information is available about the particular habitat in which the specimens were collected but, as the related species *L. crinitus* is often found inhabiting leaf litter in the alpine

Himalayan zone, *mikir* may also be a specialized litter inhabitant.

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